

This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995.

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SECTION 14 20 00 (SECTION 14200) – ELEVATORS

SPECIFIER NOTE:

resource management: Refer to Division 05 (5) for information regarding metal products. Refer to the applicable Division 09 (9) section for information regarding interior finish products.

toxicity/IEQ: Hydraulic fluids and lubricants used in elevators can cause indoor air quality problems when exposed to indoor air stream. Hydraulic fluids and lubricants can contaminate groundwater.

performance: Elevators consume a significant fraction of the total energy used in tall buildings. In low-rise and mid-rise buildings, their energy use is less substantial, but opportunities for improving conventional practices are huge. In addition to reducing energy use, newly selected elevators should minimize other environmental concerns, such as the potential for leaking hydraulic fluid, maintenance requirements, and future replacement cost.

In very general terms, elevators for low- and mid-rise buildings are typically either hydraulic or traction (gear-driven) systems, while high-rise buildings use variable voltage-variable frequency (VVVF) controlled gearless AC-motors replacing earlier DC technology. A more recent evolution is the availability of VVVF systems for low- and mid- rise applications, which makes the energy efficiency and comfort of that technology available to buildings that are not so tall.

For information on energy efficient elevator options, refer to “Greening Federal Facilities: An Energy, Environmental, and Economic Resource Guide for Federal Facility Managers and Designers” published by The Federal Energy Management Program (FEMP) <http://www.eere.energy.gov/femp/pdfs/29267-0.pdf>

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
1. **[Hydraulic] [Traction] [Variable Voltage-Variable Frequency]** Elevators.

1.2 SUBMITTALS

- A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content. USGBC-LEED™ v3, for example, includes credit for materials with recycled content, calculated on the basis of pre-consumer and post-consumer percentage content, and it includes credit for use of salvaged/recovered materials.

Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

1. Recycled Content:
 - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
 - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

SPECIFIER NOTE:

Specifying local materials may help minimize transportation impacts; however it may not have a significant impact on reducing the overall embodied energy of a building material because of efficiencies of scale in some modes of transportation.

Green building rating systems frequently include credit for local materials. Transportation impacts include: fossil fuel consumption, air pollution, and labor.

USGBC-LEED™ v3 includes credits for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Green Globes US also provides points for materials that are locally manufactured.

2. Local/Regional Materials:
 - a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
 - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
 - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
 - d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

SPECIFIER NOTE:

The Food, Conservation, and Energy Act of 2008 (also known as the 2008 U.S. Farm Bill) largely continues programs of the Farm Security and Rural Investment Act of 2002 ([2002 Farm Bill](http://www.usda.gov/farbill/)) <http://www.usda.gov/farbill/> Section 9002 requires each Federal Agency to develop a procurement program which will assure that items composed of biobased products will be purchased to the maximum extent practicable and which is consistent with applicable provisions of Federal procurement law. USDA designates biobased products for preferred Federal procurement and recommends biobased content levels for each designated product.

USGBC-LEED™ v3 includes credits for use of rapidly renewable materials, which USGBC describes as plants harvested within a ten-year cycle.

Green Globes – US, provides credit for integration of materials from renewable sources that have been selected based on life-cycle assessment.

3. Biobased materials:
 - a. Indicate type of biobased material in product.
 - b. Indicate the percentage of biobased content per unit of product.
 - c. Indicate relative dollar value of biobased content product to total dollar value of product included in project.

SPECIFIER NOTE:

Electric motors vary greatly in performance. The selection of energy-efficient motors for HVAC equipment and other applications in existing or new facilities can greatly reduce energy consumption.

FEMP offers training to facility managers on the use of *MotorMaster+* software and other motor system management topics. Contact the FEMP Help Desk at (800) DOE-EREC (363-3732), or FEMP Web site at <http://www.eere.energy.gov/femp/>

DOE's Motor Challenge Hotline, (800) 862-2086, provides information, software, and publications. The Motor Master Program is available through the U.S. DOE OIT Best Practices; *MotorMaster+4.0* can be downloaded or used online:

http://www1.eere.energy.gov/industry/bestpractices/software_motormaster.html

4. Energy Efficiency:

- a. Indicate MotorMaster assessment for equipment provided under work of this Section.

- B. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

PART 2 PRODUCTS

SPECIFIER NOTE:

EO 13423 includes requirements for Federal Agencies to use "sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products"

Specifically, under the Sustainable Building requirements per Guiding Principle #5 Reduce Environmental Impact of Materials, EO13423 directs Federal agencies to "use products meeting or exceeding EPA's recycled content recommendations" for EPA-designated products and for other products to "use materials with recycled content such that the sum of post-consumer recycled content plus one-half of the pre-consumer content constitutes at least 10% (based on cost) of the total value of the materials in the project."

Additionally, for USDA-designated biobased products, Federal agencies must use products meeting or exceeding USDA's biobased content recommendations; and for other products, biobased products made from rapidly renewable resources and certified sustainable wood products.

EO 13423 includes requirements for Federal Agencies to "... improve energy efficiency and reduce greenhouse gas emissions ... by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of ... year 2003"

Specifically, under the Sustainable Building requirements per Guiding Principle #2 Optimize Energy Performance, EO 13423 directs Federal Agencies to "design to earn the Energy Star targets for new construction and major renovation" and, for "new construction, reduce the energy cost budget by 30 percent compared to the baseline building performance rating per the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., (ASHRAE) and the Illuminating Engineering Society of North America (IESNA) Standard 90.1-2004, Energy Standard for Buildings Except Low-Rise Residential. For major renovations, reduce the energy cost budget by 20 percent below pre-renovations 2003 baseline."

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. <http://www.ofee.gov/execorders.asp> It expands upon the environmental performance requirements of EO 13423.

http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous federal requirements in several areas, including sustainable buildings and communities. Federal agencies must implement high performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction, including:

- Ensuring all new Federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030.
- Ensuring all new construction, major renovations, or repair or alteration of Federal buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings <http://www1.eere.energy.gov/femp/pdfs/mouhighperfsustainfedfacs.pdf>
- Ensuring at least 15% of existing agency buildings and leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress towards 100% compliance across its building inventory.

2.1 MATERIALS

A. **[Metal] [Plastic] [xxxx]:**

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content and may distinguish allowable credit for post-consumer and post-industrial (or pre-consumer) recycled content. USGBC-LEED™ v3, for example, factors 100 percent of post-consumer recycled content but only 50 percent of pre-consumer (post-industrial) recycled content into calculations for its recycled content materials credit. LEED v3 grants one credit to a project for using materials with recycled content such that the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10 percent of the total value of the materials in the project; 10% (post-consumer + 1/2 post-industrial). It grants an additional point for 20% (post-consumer + 1/2 post-industrial).

Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

Recycled content is typically determined by calculating the weight of the recycled material divided by the total weight of the product and expressed as a percentage by weight. (The recycled content “value” of a product as assessed under LEED is determined by multiplying the recycled content percentage and the cost of the product.)

Verify with manufacturer for product availability and recycled content. .

1. Recycled Content: Minimum **[5] [10] [xxxx]** percent post-consumer recycled content, or minimum **[20] [40] [xxxx]** percent pre-consumer recycled content at contractor's option.

B. Interior Cab Finish Materials:

SPECIFIER NOTE:

Edit as appropriate to project goals and location; coordinate with requirements for finish materials specified in other sections.

C. Hydraulic Fluid:

SPECIFIER NOTE:

For current designations under the Federal Biobased Products Preferred Procurement Program (FB4P), refer to www.biobased.oce.usda.gov. As of January 4, 2010, the Federal Register includes designations for approximately 60 product types. The requirements for purchasing biobased items apply to those items directly purchased by the federal agency. Under a construction contract, the contractor's use of hydraulic fluid in its bulldozers and backhoes is incidental to the purpose of its contract, so the contractor is not required to use biobased hydraulic fluids. The Office of the Federal Environmental Executive (OFEE) recommends that agencies encourage the use of these items, however.

Currently designated items that affect construction include:

- Roof Coatings

- Water Tank Coatings
- Adhesive and Mastic Removers
- Composite Panels
- Fertilizers
- Plastic Insulating Foam
- Carpet and Upholstery Cleaners
- Carpets
- Dust Suppressants
- Packaging Films
- Glass Cleaners
- Hydraulic Fluids – Stationary Equipment
- Wood and Concrete Sealers
- Cleaners

The USDA currently has identified about 150 items for which it is collecting test data needed for the additional designations of items that will extend preferred procurement status to include all qualifying biobased products.

1. Biobased Content:
 - a. Hydraulic Fluids – Stationary Equipment: Fluids formulated for use in stationary hydraulic equipment systems that have various mechanical parts, such as cylinders, pumps, valves, pistons, and gears, that are used for the transmission of power (and also for lubrication and/or wear, rust, and oxidation protection). Provide minimum 44% biobased content.
2. Resource Management: Assess biodegradability of hydraulic fluids in accordance with ASTM D6006.
 - a. Environmental persistence of hydraulic fluids: **[Pw1] [Pw2] [xxxx]** in accordance with ASTM D6046. Class Pw4 will not be permitted.
 - b. Acute ecotoxicity: Ts1 for soil and Tw1 for water in accordance with ASTM D6046.

2.2 FABRICATED UNITS

- A. Motors and System Controls:
 1. Energy Efficiency:
 - a. Motors: Energy efficient as demonstrated under FEMP-MotorMaster.
 - b. Controls: **[Provide computerized controls that can be programmed to cut off power to some cars during low-usage periods, reducing standby energy use.] [Provide computerized controls capable of optimizing energy consumption in addition to reducing response and travel time, including systems based on fuzzy logic that self-adjust based on travel patterns.]**
 - c. Cab Lighting: As specified in Section 26 50 00 (16500) - Lighting.

PART 3 - EXECUTION

3.X SITE ENVIRONMENTAL PROCEDURES

- A. Resource Management:
 1. Energy Efficiency: Verify equipment is properly installed, connected, and adjusted. Verify that equipment is operating as specified.

- B. Indoor Air Quality:
 - 1. Temporary ventilation: Provide temporary ventilation as specified in Section 01 57 19.11 (01352) – Indoor Air Quality (IAQ) Management, and as follows:
 - a. Isolate lubricated equipment from the circulating air or air in the shaft, and pressurize elevator lobbies relative to the shaft to minimize escaping air from the shaft.
 - b. Ventilate the shaft with negative pressure.

END OF SECTION